

Reading, Language, and the Brain – KHC NE 102

Boston University, Fall 2014

Course Overview and Organization

Lecture:	MW 12:00-1:30pm	Instructor:	Tyler Perrachione, Ph.D. [ˈpɛ.ɹəʃən]
Place:	xyz 123	E-mail:	tkp@bu.edu
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		Office Hours:	Monday, 3:00-5:00pm (& by appointment)

Course Description:

Although we often think of written and spoken language as interchangeable, how children acquire these two abilities couldn't be more different: Children effortlessly learn to speak and understand language just by listening to it being spoken around them. On the other hand, becoming an expert reader requires years of explicit instruction and effortful practice. Some individuals, with a condition known as developmental dyslexia, will even face a lifelong struggle with reading difficulties. This course explores the scientific study of reading and language development – a richly multidisciplinary effort that bridges the fields of psychology, linguistics, neuroscience, and education. The emphasis of this course will be on the modern scientific effort to understand “the reading brain”: how learning to read changes our brain in myriad ways, coordinating neural systems for vision, hearing, language, and memory. Specific topics will include the history of the alphabet and other writing systems, how different cultures' writing systems produce different reading brains, how brain injuries can result in specific impairments in language and reading, and how brain imaging is helping unravel the mystery of reading impairment. (4 credits)

Required Texts:

- *The Language Instinct: How the Mind Creates Language*
by Steven Pinker. ISBN: 9780061336461
- *Reading in the Brain: The New Science of How We Read*
by Stanislas Dehaene. ISBN: 9780143118053
- *Proust and the Squid: The Story and Science of the Reading Brain*
by Maryanne Wolf. ISBN: 9780060933845
- *Early Literacy*
by Joan Brooks McLane & Gillian Dowley McNamee. ISBN: 9780674221659
- Additional chapters and articles made available electronically via Blackboard.

Course Structure:

Bi-weekly class meetings will begin with a brief lecture that introduces the major themes for that class, then most of class time will be spent discussing the background reading. Students should come to class prepared to talk about the background reading, to expound on what they learned, and to ask questions about material they did not understand. Some class meetings that address advanced topics will have a larger lecture component. At each meeting, students will submit a written *Reading Response* that describes their learning and reaction to the background reading. Students will complete three *Topic Papers* on subjects of increasing complexity, and give an in-class *Topic Presentation* that explores a topic from the readings in greater depth. Students will develop an account of their own learning in this course by writing an introspective essay at the course's beginning and, at the course's conclusion, commenting on how their views have changed based on what they learned.

Assessment & Grading:

- 20% Attendance and Discussion
- 15% Reading Responses
- 10% Topic Presentation
- 45% Topic Papers (3 @ 15% each)
- 10% Introspective Essay and Learning Commentary

Letter Grade Cutoffs:

A 93% A- 90% B+ 87% B 84% B- 80% C+ 77% C 74% C- 70%

Class Attendance & Participation in Discussion:

Students are expected to attend class meetings and participate in lecture and discussion. In-class lectures and discussions provide an inimitable opportunity to engage with the course material and enhance learning by asking questions and getting feedback on ideas and opinions. Students should come to class each meeting having completed the background readings and being prepared to make a substantial contribution to the in-class discussion. Students who must be absent for a valid reason should make arrangements with the instructor in advance.

Introspective Essay and Learning Commentary:

After the first class meeting, students will be asked to write a short essay on “How I think language and reading work.” Don't worry that we haven't covered any content in class yet! Instead, use this essay as an opportunity to explain and think critically about your suspicions and hunches as to language, reading, and the brain. What do you think is going on in there? What personal experiences have you had (or observed) with learning to read? How is written language similar to (or different from) spoken language? Why do you think some people might struggle all their lives with reading difficulties? Do you think different writing systems engage the brain differently, and if so how? How can we figure out how the brain supports our abilities to use language and learn to read? In this essay, consider any of these topics, or others that you think of on your own that relate to the scope of the course. Feel free to speculate, draw on your personal experiences, or knowledge from previous courses. The goal of this essay is to start thinking critically about what you know about how language and reading work. You might find at the end of the semester that you had a lot of misconceptions about these topics!

At the end of the semester, you will revisit your *Introspective Essay* with a new perspective. Using all the knowledge you have gained in this course, you will write a commentary on your earlier ideas: Were you way off base about any topics? If so, what misconceptions did you have originally and what do you understand about these topics now? Did you make any predictions that turned out to be true? If so, what evidence did we learn about in class that supports your earlier ideas? Did you learn about new ideas you hadn't even imagined before the class began? Were there any questions you have about how reading and language work in the brain that we don't have answers for yet?

Format requirements: 4-6pp, double spaced, 1.0 inch margins, 12pt serif font (Times New Roman, Cambria, Georgia, Liberation Serif, etc.). Your essay should have a title that conveys its scope. See the rubrics for each of these essays at the end of the syllabus for grading details. Submit your printed, single-sided, stapled essays in class *and* submit an electronic copy on Blackboard.

Reading Responses:

Complete all of the required readings before class. Before you come to class, prepare a written response that briefly conveys your impressions of the material you read. These responses should not merely summarize the reading, instead, they should reflect your thoughts and impressions about the material. In

each response, comment on what you found interesting or impressive about the background reading. Was there anything surprising? Does something make sense that was previously confusing? Was there anything that made you uncomfortable? Is there anything with which you disagree? In the response, describe one or two important questions you developed from the reading. What do you want to know more about? Is there anything you think science should explore further? Do the authors of different background readings seem to have different views, and, if so, with whom do you agree and why?

Reading Responses should be typed and should be between 250 and 500 words in length. You may format your reading responses however you see fit to best express your thoughts, impressions and questions. Feel free to use paragraphs, bulleted lists, etc. The most important thing you are trying to convey in your *Reading Responses* is that you have thought deeply about the background readings and made connections between the various course topics.

Bring your *Reading Responses* with you to class and use them as reference during the in-class discussion. Submit your *Reading Responses* to the instructor at the end of class.

Topic Papers:

During this course, students will write three *Topic Papers* in which they critically evaluate core concepts related to reading, language, and the brain. Students will work to develop their expository and persuasive writing abilities with guidance from the instructor. Particular emphasis will be placed on articulating a thesis, developing a coherent argument to address the thesis, and supporting the thesis with specific evidence. Students are encouraged to use and cite the background readings from class as their principal references. (These are not research papers: outside references are not required. Students choosing to draw on outside resources should be judicious in selecting relevant, appropriate, and scientifically rigorous materials.)

Topic Paper #1: Human beings seem able to use language and to understand speech almost effortlessly. However, both of these tasks (recognizing speech and understanding the meaning of sentences) are still generally too hard for computers to do. Why do you think this is? Compare and contrast the ease of language use by humans with the challenges faced by computers. Using specific examples from chapters in *The Language Instinct*, describe why you think it has been so hard to program a computer to recognize speech or to understand language. In your paper, pick one of these two problems (recognizing speech or understanding meaning) to focus on in depth. *Length:* 4-6pp

Topic Paper #2: Respond to one of the following prompts: **(i)** Do animals have language; why or why not? -or- **(ii)** Why is our understanding of the brain's visual system so much more detailed than our understanding of the brain's language system? *Length:* 5-7pp

Topic Paper #3: Respond to one of the following prompts: **(i)** Should the English spelling system be reformed; why or why not? -or- **(ii)** Compare and contrast how children learn language vs. how they learn to read. *Length:* 6-8pp

General format requirements: Double spaced, 1.0 inch margins, 12pt serif font (Times New Roman, Cambria, Georgia, Liberation Serif, etc.). Each *Topic Paper* should have a title that conveys its scope. See the rubric at the end of the syllabus for grading details. Submit your printed, single-sided, stapled essays in class *and* submit an electronic copy on Blackboard.

Topic Presentation:

At the end of the semester, students will lead an in-class presentation that explores one of the topics from class in greater depth. This may include a critical evaluation of one of the hypotheses posed by Steven Pinker, Stanislas Dehaene, or Maryanne Wolf in their books; an exposition of one of the chapters from the background readings not covered in the syllabus; or, ideally, the presentation of a recent

scientific report from the primary research literature. Students will identify a topic from class that is of greatest interest to them, and they will work with the instructor to select the specific source material they will present to the class. This presentation may take the form of a PowerPoint slide show and commentary, a handout and discussion, or some other in-class activity that the student will lead. Students will work with the instructor to select an appropriate presentation medium for their topic.

There is no final exam for this course.

Collaboration:

Students are encouraged to discuss assignments with one another, read each others' essays, and provide constructive feedback and commentary. Every student brings a unique background and set of skills to this course, and there is much to be learned from one another. However, every assignment a student submits must be *their own work* and demonstrate *their own understanding* of the material.

Academic Integrity:

All students are expected to adhere to the policies regarding academic integrity of Boston University: <http://www.bu.edu/academics/policies/academic-conduct-code/> As scholars and future professionals, your reputation depends on the integrity of your work, including your conduct in this class. Violations of the BU Academic Conduct Code will result in an appropriate grading penalty, and may incur additional university sanctions. Students should consult the instructor if they have questions or concerns about academic integrity.

Disability Policy:

Boston University provides reasonable accommodations to eligible individuals with disabilities: <http://www.bu.edu/academics/policies/disability-accommodation/> Any student who has a disability or condition that compromises her/his ability to complete the requirements of this course must notify the instructor in writing within one week from the start of class.

Submitting Assignments and Formats of Digital Files:

Hard copies of *Reading Responses* and *Topic Papers* should be submitted in class. Students are also encouraged to submit digital copies of their assignments online using Blackboard. When submitting assignments digitally, all documents must be submitted as portable document format (.pdf) files. Using .pdf insures that documents will appear the same across all computer systems and software. *If files are submitted using some other format, they will be graded based upon how they appear on the Instructor's computer.* Students are responsible for the integrity of their digital files. Students should retain copies of all the work they produce in this course until they have received their final grades.

Late Assignments Policy:

Students perform best when adhering to reasonable external deadlines (Ariely & Wertenbroch, 2002, *Psychological Science*). For this reason, students should make every reasonable effort to submit assignments promptly by their deadline. The following conditions on late assignments are in effect:

- (1) Credit for assignments submitted after their deadline will be reduced by half.
- (2) Assignments more than seven days late will not be accepted.

If students are concerned about their ability to submit an assignment by its deadline, they should contact the instructor in advance of the deadline to discuss reasonable accommodation.

Grading Rubric for the *Introspection Essay*

Item	Points
The paper contains an introduction that clearly and succinctly describes the topic.	5
The writing is free from typos, spelling errors, and grammar errors.	5
The paper comprehensively addresses the topic, including a variety of different examples, and includes reflections from the author's own experience.	25
The author's argument is coherent and has a good flow. There are appropriate transitions between paragraphs.	10
The paper is the required length – neither too short nor too long.	5
Total:	50

Grading Rubric for the *Learning Commentary on the Introspection Essay*

Item	Points
The paper contains an introduction that clearly and succinctly describes the major differences between the Introspection Essay and the content learned in class during the semester.	5
The paper comprehensively addresses the topic. For each of the major points raised in the author's original Introspection Essay, this commentary describes how they are clarified by what was learned in this class.	15
The paper raises additional issues that were not covered in the Introspection Essay but which we learned about in class. The author comments on why these issues were overlooked originally and why they are important to the scientific study of reading, language, and the brain.	15
The author's argument is coherent and has a good flow. There are appropriate transitions between paragraphs.	5
The writing is free from typos, spelling errors, and grammar errors.	5
The paper is the required length – neither too short nor too long.	5
Total:	50

Grading Rubric for the *Topic Presentation*

Item	Points
The presenter has a good command of the content – the information is presented clearly and authoritatively.	15
The presentation provides a clear introduction and summary of the topic before starting with specific details and examples. The presentation is the required length – neither too short nor too long.	15
Visual materials (handouts or slides) are effective. The presenter does not simply read from the slides or handout. Media (photos, graphs, diagrams, videos, audio, etc.) are clear and informative.	30
The topic of the presentation is explicitly connected to the material we have read or discussed in class.	30
The presenter is able to answer questions about the topic.	10
Total:	100

Grading Rubric for the *Topic Papers*

Item	Points
The writing is free from typos, spelling errors, and grammar errors.	10
The paper contains an introduction that clearly and succinctly describes the topic.	10
The introduction ends with the author's specific thesis, which clearly describes the central argument in to be presented in the paper.	10
The author's argument is coherent and has a good flow. There are appropriate transitions between paragraphs. The content of each paragraph clearly relates to the author's thesis.	20
Arguments are supported appropriately by evidence. Rebuttals to potential counter arguments are presented when appropriate.	20
The author uses quotes and citations appropriately to give credit to others for their ideas.	10
The paper contains a conclusion that summarizes its arguments and re-emphasizes the author's thesis.	10
The paper is the required length – neither too short nor too long.	10
Total:	100

Reading, Language, and the Brain – KHC NE 102
Course Schedule
(Fall 2014)

Class	Date	Topics	Required Readings
1	W 9/3	Introduction to the course	---
2	M 9/8	Linguistics: The scientific study of language ► <i>Due: Introspection Essay</i>	Pinker Ch. 1 & 2
3	W 9/10	Neuroscience: How the brain creates behavior and the mind	*Nieuwenhuys Ch. 1 & 3
4	M 9/15	Language: Words, sounds, and speech	Pinker Ch. 6
5	W 9/17	Peering inside the brain: The toolbox of cognitive neuroscience	---
6	M 9/22	Syntax: How words go together	Pinker Ch. 4
7	W 9/24	Morphology and Semantics: The inner life of words	Pinker Ch. 5
8	M 9/29	The brain systems for language ► <i>Due: Topic Paper #1</i>	*Hickok (2009)
9	W 10/1	Damage to the neural systems for language (Aphasia and other neurogenic language disorders)	Pinker Ch. 10 *Selected articles
10	M 10/6	Language development: How children acquire language	Pinker Ch. 9 *Kuhl (2008)
11	W 10/8	Animal communication and the evolution of language	Pinker Ch. 11 *Selected articles
12	T 10/14	Brain development and neural plasticity	*Selected articles
13	W 10/15	The scientific study of reading	Wolf Ch. 1 Dehaene Ch. 1
14	M 10/20	Organization of the visual system	*Nieuwenhuys Ch. 19 Dehaene pp120-150
15	W 10/22	Agnosias: Neuropsychology of the visual system	*Selected articles
16	M 10/27	The history of writing ► <i>Due: Topic Paper #2</i>	Wolf Ch. 2 Dehaene Ch. 4
17	W 10/29	Contemporary writing systems around the world	Wolf Ch. 3 (pp51-60)
18	M 11/3	Brain bases of reading	Wolf pp 145-155 Dehaene pp100-116, 150-169
19	W 11/5	The “visual word form area”	Dehaene pp65-98 *Selected articles

Class	Date	Topics (continued)	Required Readings
20	M 11/10	The reading brain in different languages	Wolf Ch. 3 (pp60-78) Dehaene pp98-100 & pp116-119
21	W 11/12	Child development and discovering text	McL. & McN. Ch. 1-3 Wolf Ch. 4
22	M 11/17	Learning to read: Visual pathways to spoken language	McL. & McN. Ch. 4 Wolf Ch. 5 Dehaene pp196-208
23	W 11/19	Becoming an expert reader	McL. & McN. Ch. 5-7 Wolf Ch. 6 Dehaene pp208-232
24	M 11/24	Reading impairment: Damage to the neural system for reading ► <i>Due: Topic Paper #3</i>	*Cuomo et al. (2013) Dehaene pp54-65
--	W 11/26	THANKSGIVING – NO CLASS	---
25	M 12/1	Reading impairment: Dyslexia and the dyslexic brain	Wolf Ch. 7 Dehaene Ch. 6
26	W 12/3	The many competing theories about what causes dyslexia	Wolf Ch. 8 *Selected articles
27	M 12/8	Topic Presentations	---
28	W 12/10	Topic Presentations & Concluding discussion ► <i>Due: Learning Commentary on Introspection Essay</i>	Wolf Ch. 9 Dehaene Ch. 8

* Supplemental readings are available on Blackboard